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Report No. 8926-107

Material - Fabrics - Aluminized

Light Transmittance And Abrasion Resistance

H. Mark, J. C. George, E. E. Keller

22 September 1959

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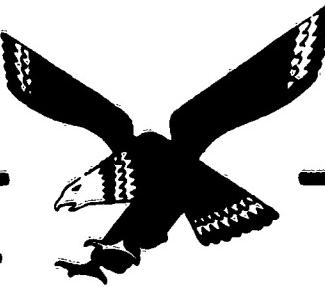
Material - Fabrics - Aluminized

Light Transmittance And Abrasion Resistance

Abstract

The abrasion resistance of Connecticut Hard Rubber Co., aluminized rubber coated fabric CHR and Minnesota Mining and Manufacturing Co., SRGA-0213 fabric was compared by Taber Abraser tests (1000 gram load, CS-17 wheel). The CHR was superior to the SRGA-0213 fabric and it withstood three times as many wear cycles to obtain about 1.3 per cent light transmittance in the 350 to 2000 micron wavelength range. The transmittance of various seam sealants (Los Angeles Standard Rubber Co., LA #1 to LA #6 inclusive) used to cover needle holes in SRGA-0213 was zero. Seam sealing tapes LA #1 and LA #7 (Los Angeles Standard Rubber Co.), and CHR Alt. No. 2 (Connecticut Hard Rubber Co.) displayed the following respective peel strengths: 2.51 2.06 and 5.16 pounds per inch width.

Reference: Mark, H., George, J. C., Keller, E. E.,
"Light Transmittance and Abrasion Resistance
of Various Aluminized Fabrics," General Dynamics/
Convair Report MP 59-344, San Diego, California,
22 September 1959. (Reference attached.)



C O N V A I R
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO

STRUCTURES & MATERIALS LABORATORIES

REPORT MP-59-344

DATE 22 September 1959

MODEL F-106

TITLE

REPORT NO. MP-59-344

LIGHT TRANSMITTANCE AND ABRASION RESISTANCE OF VARIOUS ALUMINIZED FABRICS

MODEL: F-106

CONTRACT NUMBER: AF 33(600)-36546

PREPARED BY H. Marks

GROUP Materials & Processes Lab.

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CHECKED BY: J.C. George

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CHECKED BY C. E. Keller

APPROVED BY E. F. Strong
E. F. Strong, Chief
Of Structures & Materials Labs.

NO. OF PAGES 15

NO. OF DIAGRAMS 13

W. M. Sutherland, Gyp. Engr.

REVISIONS

ACCESS NO.

Title: MATERIAL - FABRICS - ALUMINIZED. LIGHT TRANSMITTANCE AND ABRASION RESISTANCE.

Authors: Mark, H., George, J. C., Keller, E. E.
Report No: 8926-107 Date: 22 September 1959
Contract: AF 33(600)-36546

Contractor: General Dynamics/Convair

ABSTRACT: The abrasion resistance of Connecticut Hard Rubber Co., aluminized rubber coated fabric CHR and Minnesota Mining and Manufacturing Co., SRGA-0213 fabric was compared by Taber Abraser tests (1000 gram load, CS-17 wheel). The CHR was superior to the SRGA-0213 fabric and it withstood three times as many wear cycles to obtain about 1.3 per cent light transmittance in the 350 to 2000 micron wavelength range. The transmittance of various seam sealants (Los Angeles Standard Rubber Co., LA #1 to LA #6 inclusive) used to cover needle holes in SRGA-0213 was zero. Seam sealing tapes LA #1 and LA #7 (Los Angeles Standard Rubber Co.), and CHR Alt. No. 2 (Connecticut Hard Rubber Co.) displayed the following respective peel strengths: 2.51, 2.06 and 5.16 pounds per inch width.

15 pages, 1 table, 11 figures.

ANALYSIS

PREPARED BY Mark

CHECKED BY George/Keller/Sutherland

REVISED BY

CONVAIR

A DIVISION OF Vought-Sikorsky Corporation

SAN DIEGO

PAGE 1

REPORT NO. MP-50-344

MODEL F-106

DATE 22 September 19

OBJECT:

1. To determine the abrasion required on various aluminized fabrics to obtain 1% or more light transmittance in the 350 mu to 2000 mu range.
2. To obtain transmittance data on sewed seams in order to determine the effectiveness of sealing needle holes.
3. To obtain peel strength data on various seam tapes.

CONCLUSIONS:

1. Aluminized Fabric C.H.R. manufactured by Connecticut Hard Rubber Company, was superior to S.R.G.A.-0213, manufactured by Minnesota Mining and Manufacturing Company in abrasion resistance. The C.H.R. material required three (3) times as many wear cycles (Taber Abraser) to obtain approximately 1.3% transmittance in the 350 mu to 2000 mu range.
2. The transmittance of various seam - sealants used to cover needle holes on S.R.G.A.-0213 fabric was zero. These seam sealants, LA #1 through LA #6, were supplied by Los Angeles Standard Rubber Company.
3. Of the various seam tapes tested C.H.R. Alt. No. 2, manufactured by Connecticut Hard Rubber Company showed the greatest peel strength.

TEST SPECIMENS AND PROCEDURE:

Test Specimens:

The following specimens were subjected to abrasion and tested for light transmittance:

1. C.H.R. Aluminized rubber coated fabric (Connecticut Hard Rubber)
2. S.R.G.A.-0213 (Minnesota Mining and Manufacturing Company)

The following S.R.G.A.-0213 specimens received transmittance tests on needle holes closed using the following seam sealants:

1. LA #1 (Los Angeles Standard Rubber Company).
2. LA #2 (Los Angeles Standard Rubber Company).
3. LA #3 (Los Angeles Standard Rubber Company).
4. LA #4 (Los Angeles Standard Rubber Company).
5. LA #5 (Los Angeles Standard Rubber Company).
6. LA #6 (Los Angeles Standard Rubber Company).

ANALYSIS

PREPARED BY Mark

CHECKED BY George/Keller/Sutherland

REVISED BY

C O N V A I R

CONVAIR CORPORATION

SAN DIEGO

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MODEL P-106

DATE 22 September 19

TEST SPECIMENS AND PROCEDURE: (Cont'd)

Test Specimens: (Cont'd)

Peel strength tests were made on the following seam sealing materials.

1. LA #1 (Los Angeles Standard Rubber Company).
2. LA #7 (Los Angeles Standard Rubber Company).
3. C.H.R. Alt. (Connecticut Hard Rubber Company)
No. 2

Test Procedure:

Test Specimens C.H.R. and S.R.G.A.-0213 were tested with the Taber Abraser using a 1000 gram load and CS-17 wheel. Transmittances of both samples were obtained with a spectrophotometer in the 350 mu to 2000 mu range after intervals of wear cycles on the Taber Abraser until each specimen showed a transmittance of 1% or more.

Transmittances were also obtained on needle holes covered by seam sealants LA #1 thru LA #6 on S.R.G.A.-0213 fabric while the fabric in each case was drawn taut.

Peel strengths were obtained using seam tapes LA #1, LA #7 and C.H.R. Alt. No. 2. A autographic peel tester, as described in Report No. 8-07310, was used to make evaluations.

RESULTS:

The results of the transmittance tests after different wear cycles on the Taber Abraser for Fabrics S.R.G.A.-0213 and C.H.R. are shown in Figures 1 thru 4.

The results show that Fabric C.H.R. required 1500 wear cycles on the Taber Abraser to obtain a transmittance of approximately 1.3%, while Fabric S.R.G.A.-0213 required 500 wear cycles.

The results of the transmittance tests on seam sealants LA #1 thru LA #6 are shown in Figures 5 thru 11. All of these samples showed zero per cent transmission.

The results of the peel strength tests are shown in Table I. Of the various seam tapes which were tested, Fabric C.H.R. Alt. No. 2 showed the highest peel strength.

NOTE:

The data from which this Report was prepared are recorded in Engineering Test Laboratories Data Book No. 3056.

ANALYSIS

PREPARED BY Mary

CHECKED BY George/Keller/Sutherland

REVISED BY

CONVAIR

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REPORT NO MP-10-344

MODEL F-106

DATE 22 Sept. 1

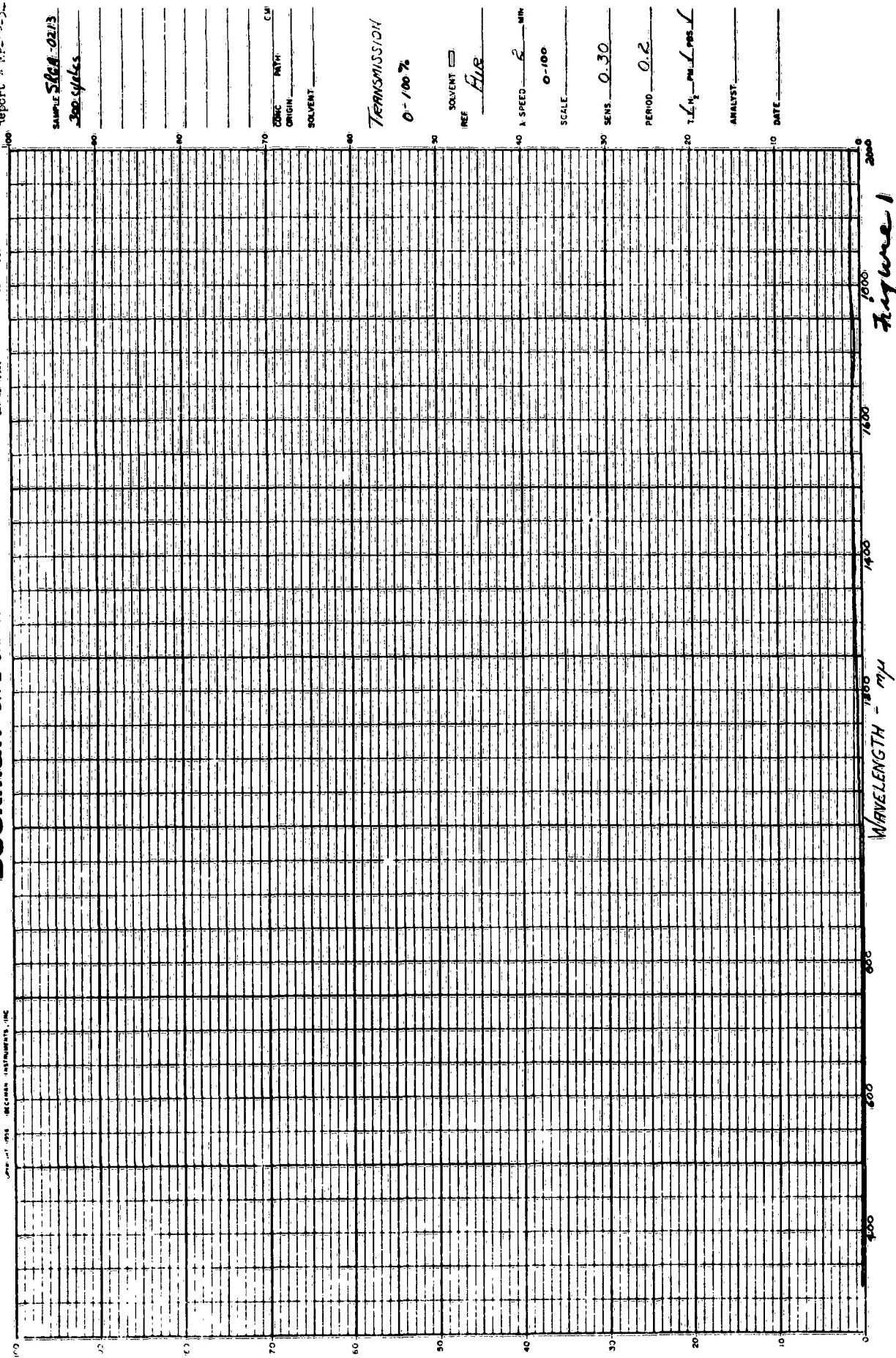
TABLE I

RESULTS OF PEEL STRENGTHS OF ALUMINIZED FABRICS

<u>FABRIC</u>	<u>PEEL STRENGTH (LBS./IN.)</u>
LA #1	2.51
LA #7	2.06
C.F.R. Alt. #2	5.16

Beckman DK-2 CHART

Page 4
Report # NP-10-3



Beckman DK-2 CHART

Page 5
Report No. 125-321

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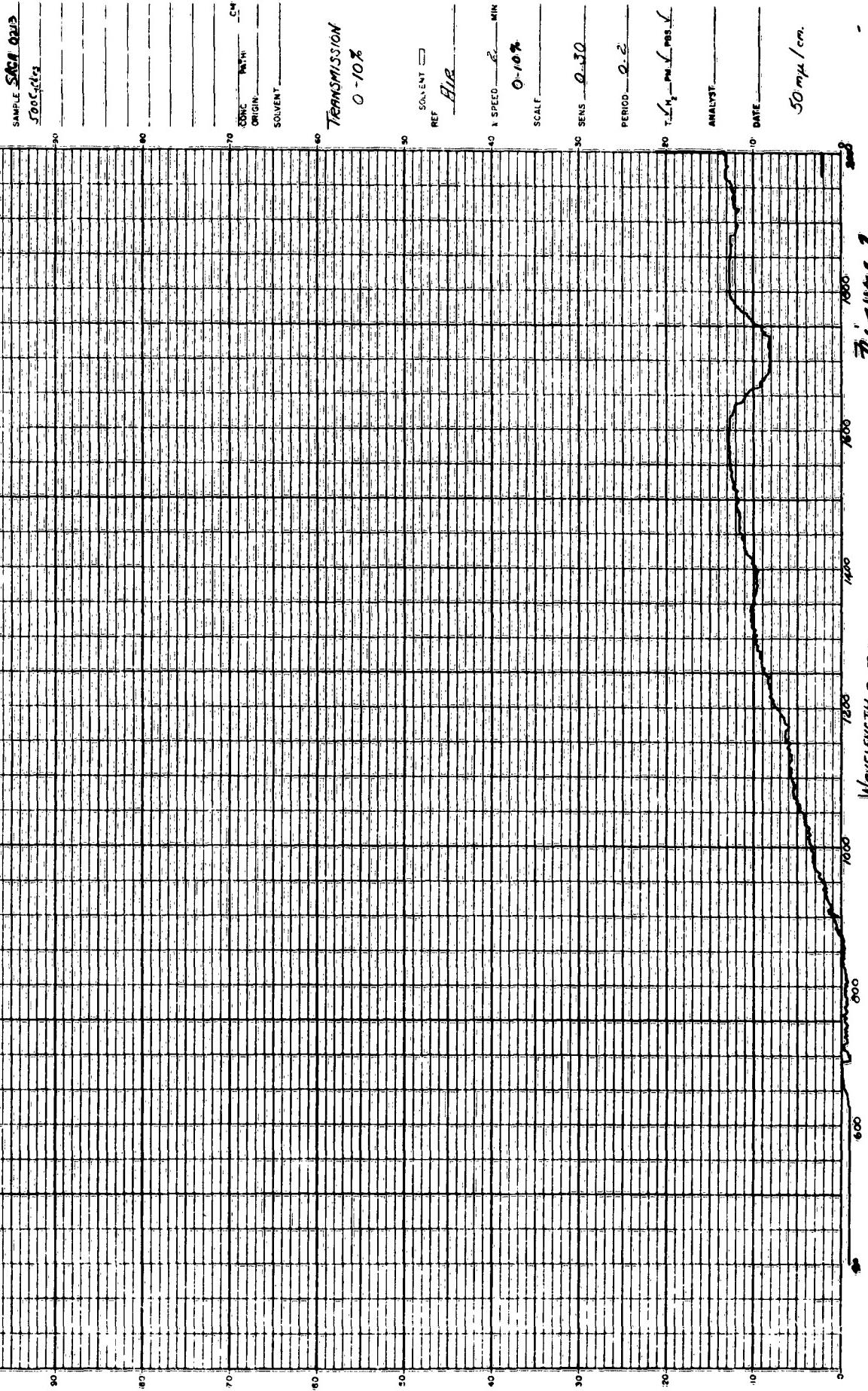


Figure 2
WAVELENGTH - m μ

Beckman DK-2 CHART

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Pile 6
NP-53-36-1

POINT TO USE

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Report No.

SAMPLE: CuR
1000 speciesCONC: 0.01
PATH: 1cmORIGIN: SOLVENT: TRANSMISSION:
0 - 100%
100
90
80
70
60
50
40
30
20
10
0REF: AuSOLVENT: REF: AuSPEED: 2 MINSCALE: 2XSENS: 0.30T/C: 1/2 PMV PAS ✓RAMPD: 0.2ANALYST: DATE: 60 minutesWAVELENGTH: 1000
Repure 3

Beckman DK-2 CHART

Figure 7

Courtesy of Beckman Instruments, Inc.

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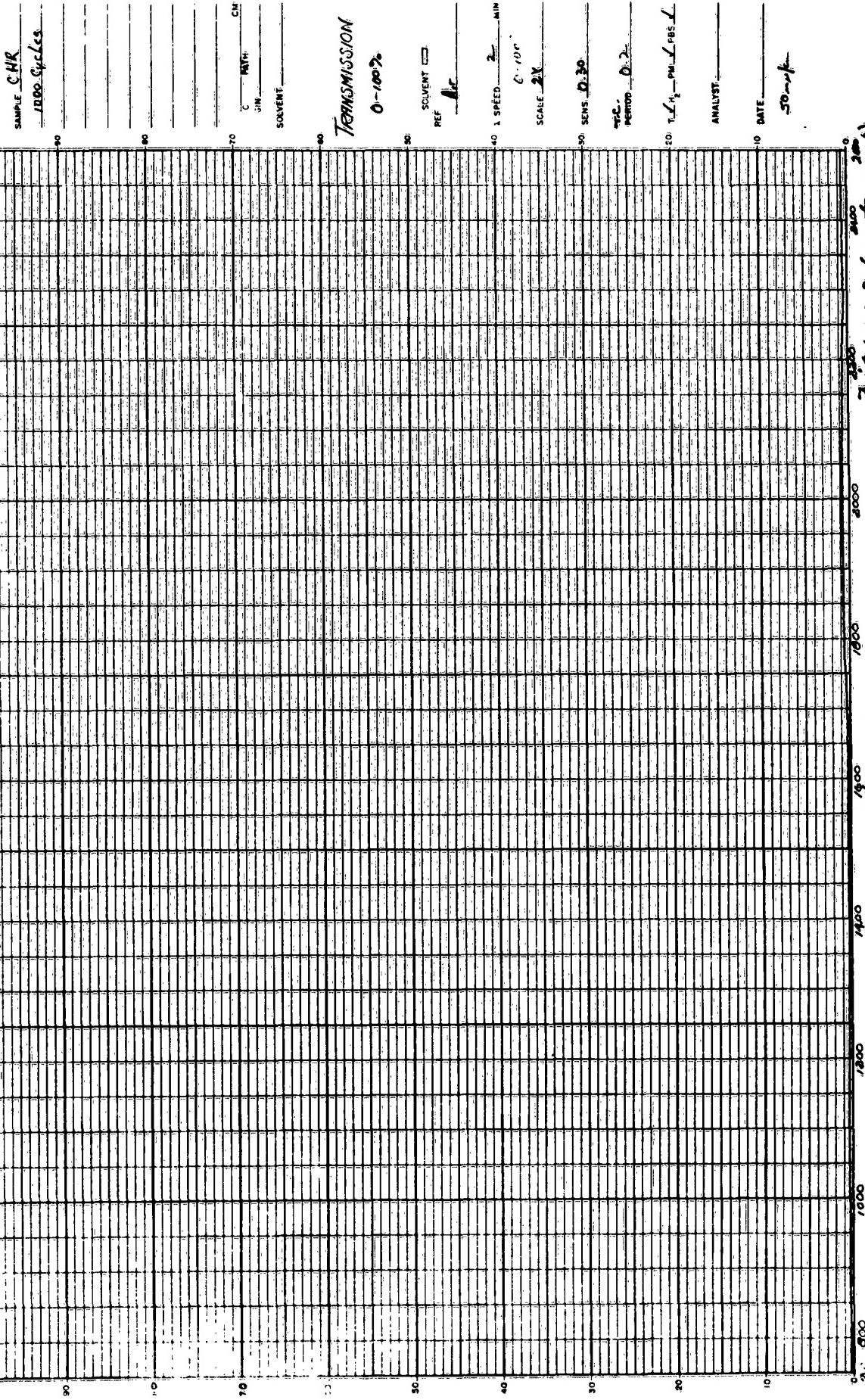


Figure 3 (continued)

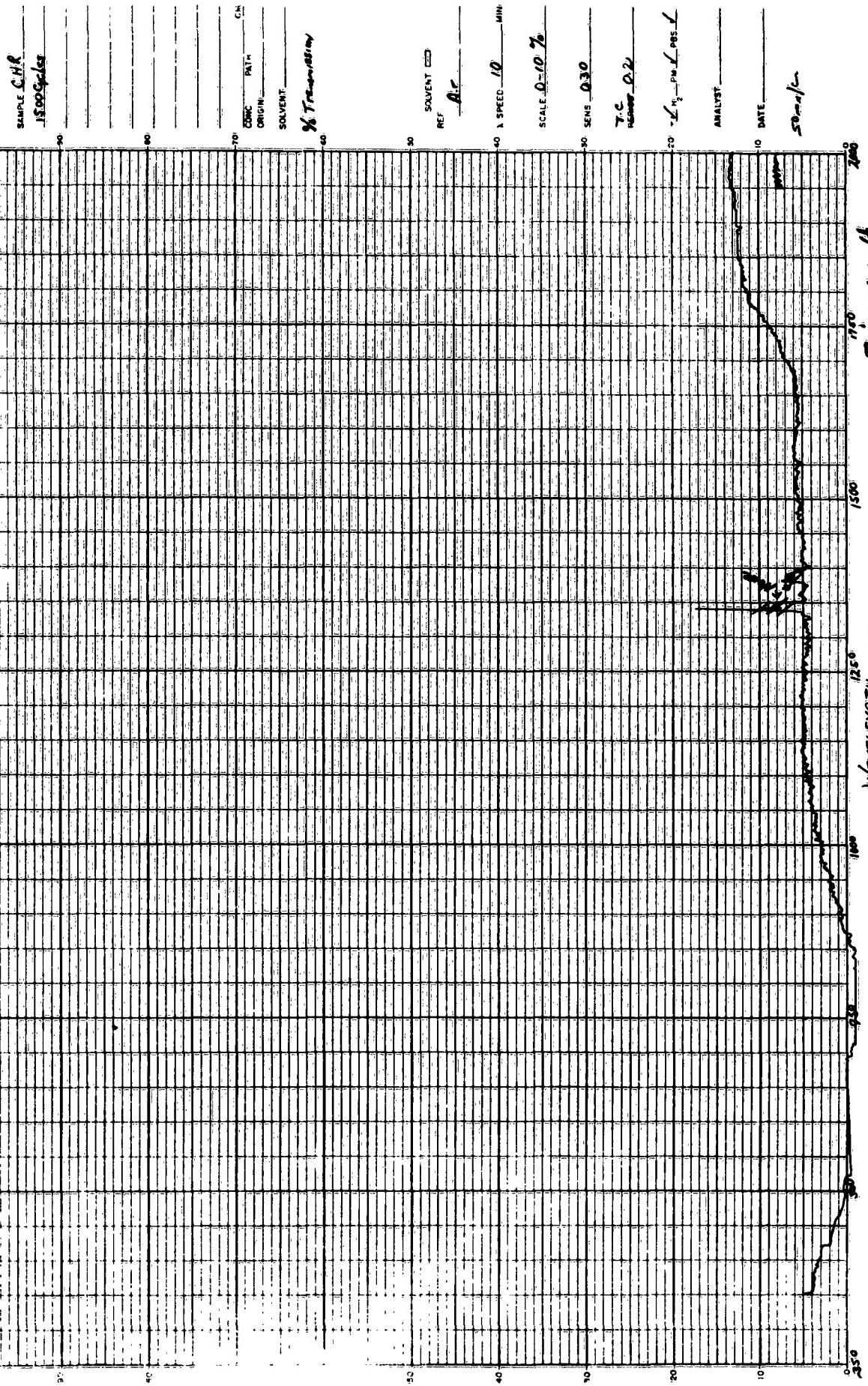
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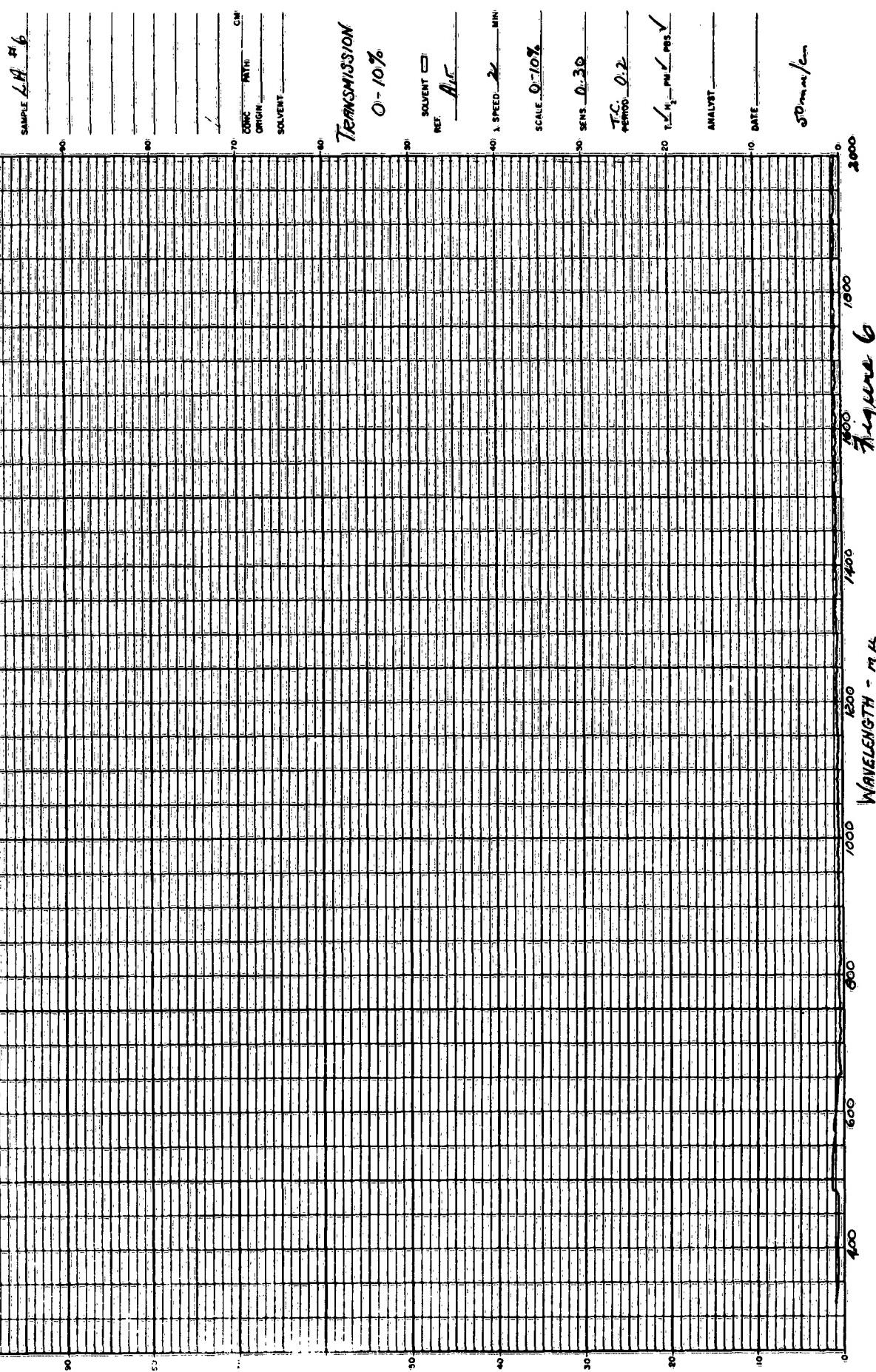


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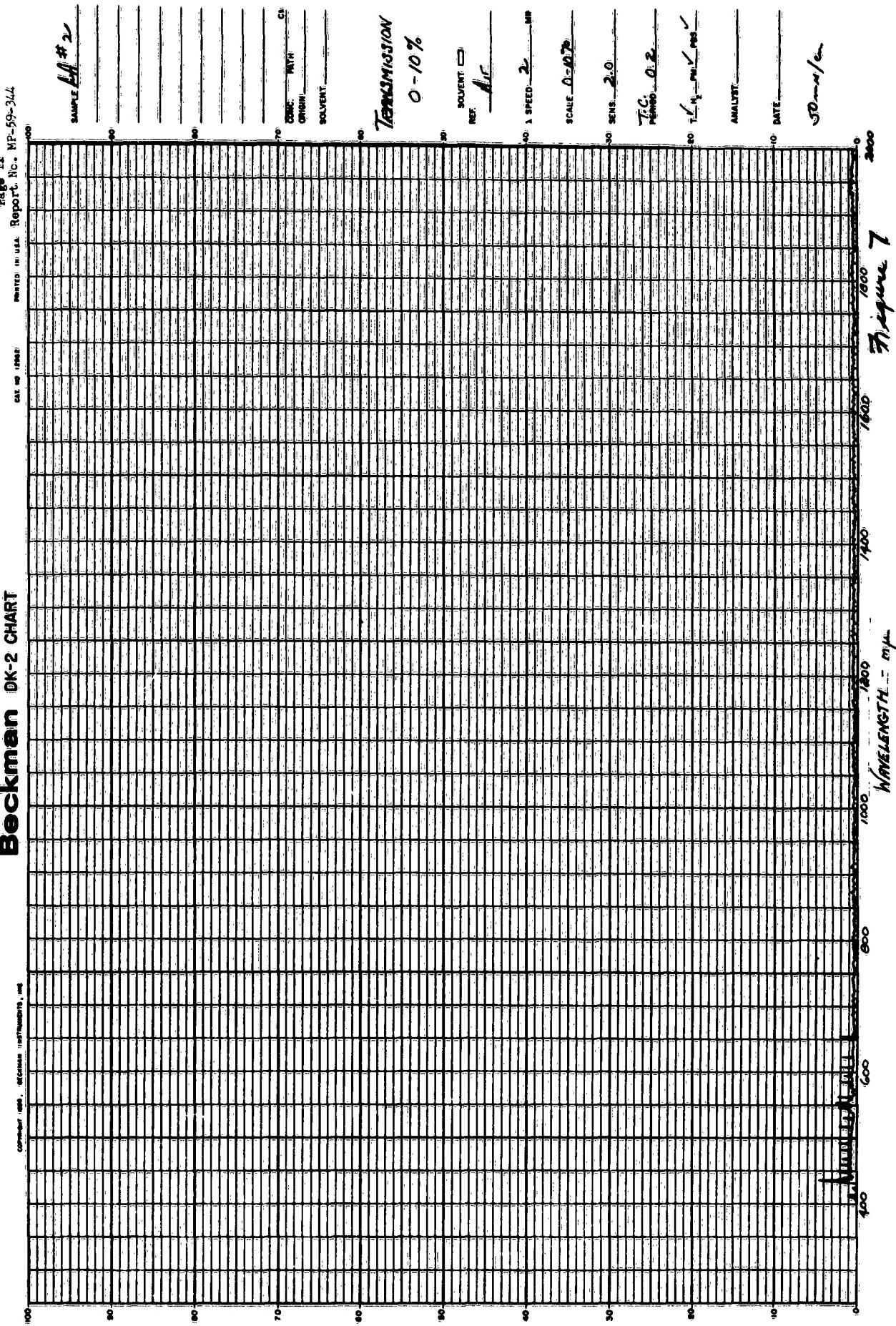
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Beckman DK-2 CHART

Page 11 Report No. MP-59-344



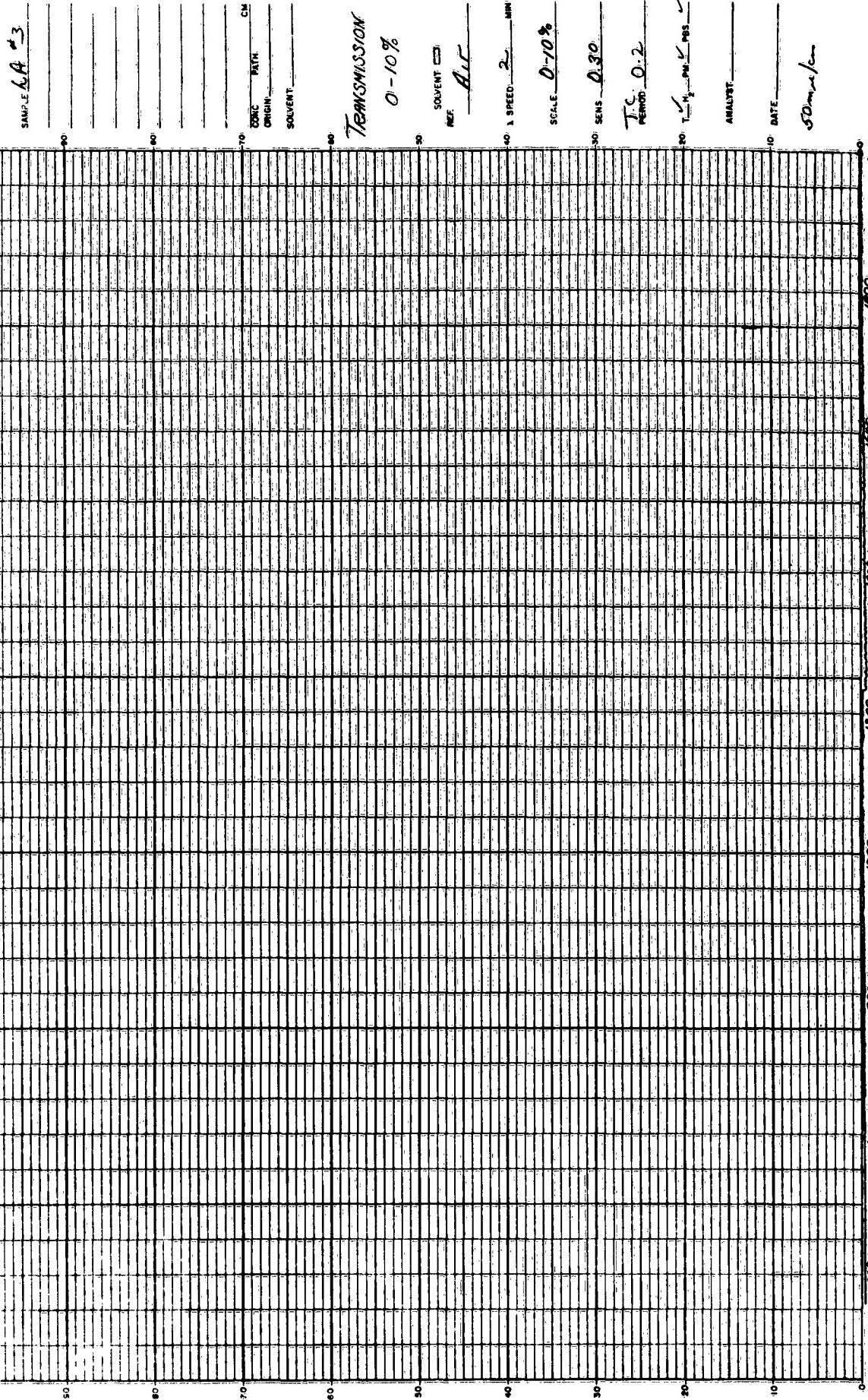
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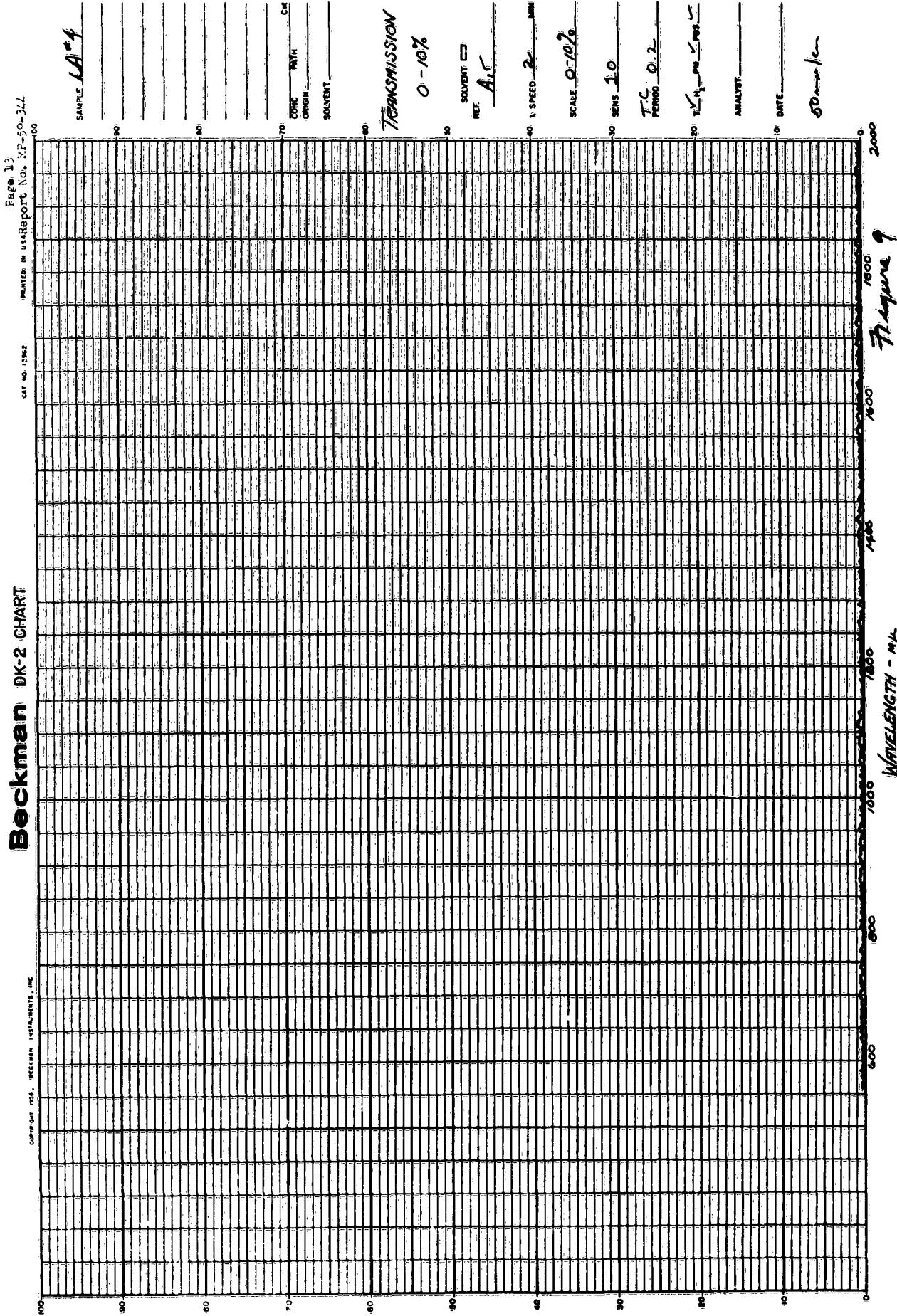
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Beckman DK-2 CHART

PAGE 11
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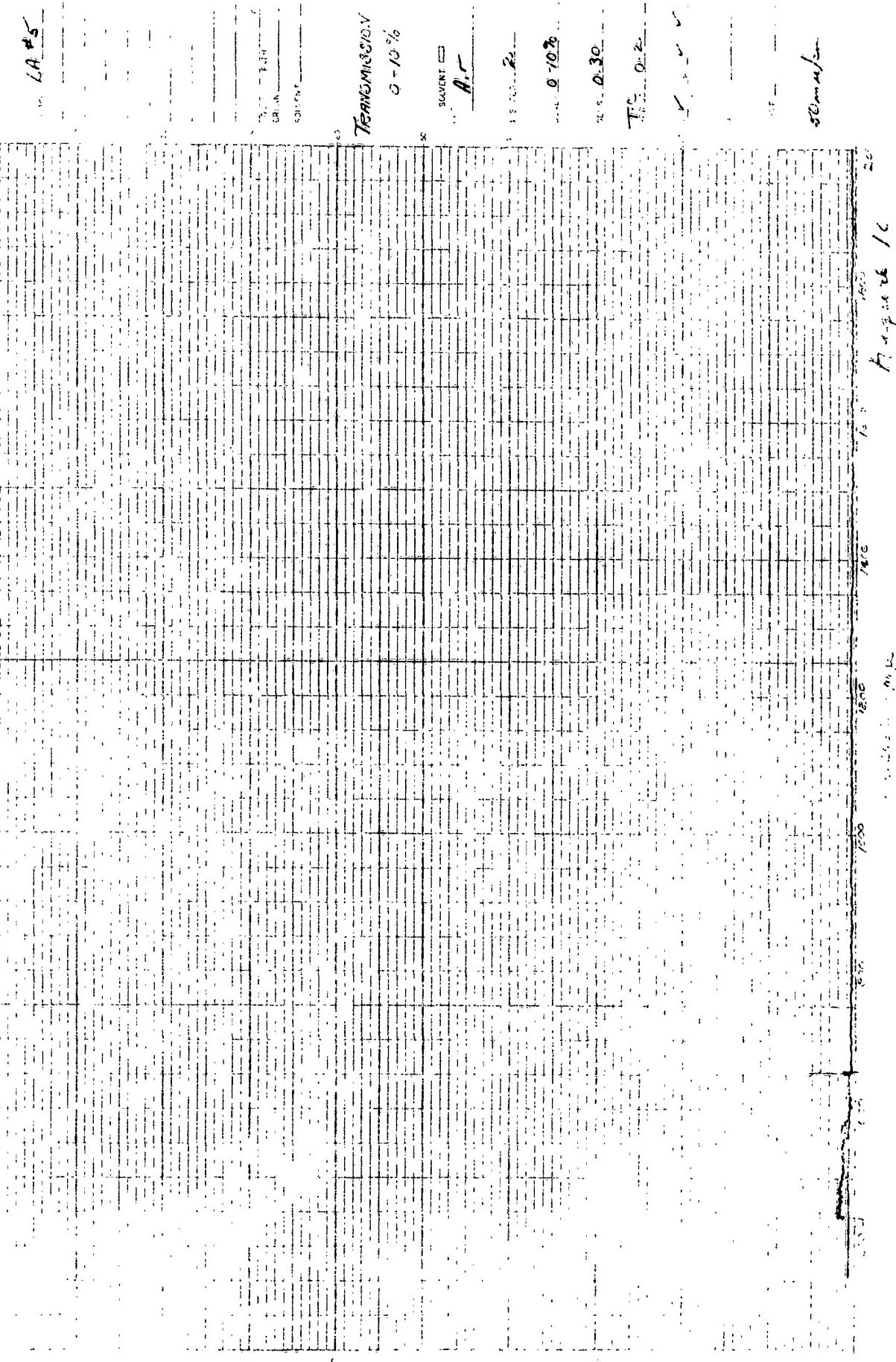
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THE SKYSCRAPER CHART

LA #5



Beckman DK-2 CHART

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